The pervasive role of sex mindset: Beliefs about the malleability of sexual life is linked to higher levels of relationship satisfaction and sexual satisfaction and lower levels of problematic pornography use

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ABSTRACT

The present two-study research examined the link between problematic pornography consumption, relationship satisfaction and sexual satisfaction by considering malleability beliefs about sexual life. In Study 1, the Sex Mindset Scale was created which measures beliefs about the changeability of sexual life. Exploratory Factor Analyses ($N_1 = 755$) indicated a one-factor structure, Confirmatory Factor Analyses ($N_2 = 769$) consolidated the previously established factor structure and the measure was reliable. In Study 2 ($N_3 = 10,463$), structural equation modeling (SEM) was used to explore the associations between gender, sex mindset, problematic pornography use, relationship and sexual satisfaction. The examined model showed that growth sex mindset had moderate positive association with sexual satisfaction and relationship satisfaction while problematic pornography use only showed a negative, but weak one. According to the present results, beliefs about the malleability of sexual life play a more important role in relationship satisfaction and sexual satisfaction than problematic pornography use. Moreover, sex mindset was negatively associated with problematic pornography use indicating that growth sex mindset can reduce the extent of problematic pornography consumption. In sum, sex mindset can be considered as an underlying pervasive sexuality-related implicit theory that can influence the individual's topic-relevant thinking and behavior through different pathways.

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In most of the cases, pornography viewing is not problematic; however, it can become problematic and can negatively affect one's life such as problems in romantic relationships as has been reported in previous studies (e.g., Bergner & Bridges, 2002; Ford, Durtschi, & Franklin, 2012; Gwinn, Lambert, Fincham, & Maner, 2013; Pyle & Bridges, 2012; Oddone-Paolucci, Genius & Violato, 2000; Szymanski & Stewart-Richardson, 2014). In the scientific literature, addiction and problematic use are generally used as synonyms; however, it is more proper to use the term "*problematic use*" instead of "*addiction*", when clinical evidence of an actual addiction cannot be provided (Ross, Mansson, & Daneback, 2012). The definition of problematic online pornography was suggested by Kor et al.'s (2014) which includes the main cores of problematic behaviors (Potenza, 2006; Shaffer, 1999). In their definition four main points were emphasized: (a) the individual engages in online pornography use highly frequently or excessively; (b) prior to the engagement in online pornography use an urge is present

with a goal to avoid negative feelings and emotions or to reach positive emotional state; (c) the person has a decreased self-control regarding the behavioral engagement; (d) and the individual continues to engage in online pornography use despite the negative consequences that can lead to personal distress and functional impairment. Problematic pornography consumption was negatively, but only weakly associated with romantic relationship outcomes such as relationship satisfaction, relationship quality, relationship investment and sexual satisfaction (Blais-Lecours, Vaillancourt-Morel, Sabourin, & Godbout, 2016; Stewart & Szymanski, 2012; Szymanski, Feltman, & Dunn, 2015; Szymanski & Stewart-Richardson, 2014). Moreover, according to a recent experimental study, pornography consumption was positively related to online flirting, "hooking up" behavior and infidelity, and this association was mediated by the extent of commitment (Lambert, Negash, Stillman, Olmstead, & Fincham, 2012). These results indicated that complex and multivariate associations could be drawn between problematic pornography use and romantic relationship outcomes such as relationship satisfaction and sexual satisfaction. On the basis of previous research, in the present study, we examined the associations between problematic pornography use, relationship satisfaction and sexual satisfaction with the consideration of sex mindset (beliefs

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about the malleability of sexual life) as a pervasive implicit theory of sexuality.

Sexual life is an important aspect of romantic relationships, therefore it can be considered as one of the key contributing factors to relationship satisfaction (Butzer & Campbell, 2008; McNulty, Wenner, & Fisher, 2014; Sprecher, 2002). Individuals could use pornography in order to improve their sexual life (Hald et al., 2015; McKee, 2007; Rogala & Tydén, 2003). However, pornography could negatively affect both the individual's sexual life and relationship satisfaction (Blais-Lecours et al., 2016; Stewart & Szymanski, 2012; Szymanski & Stewart-Richardson, 2014; Szymanski et al., 2015). Moreover, the quality of the relationship could be negatively influenced by the perception of the problematic pornography consumption of one's partner (Stewart & Szymanski, 2012). In sum, it can be hypothesized that the association between problematic pornography use and relationship satisfaction and sexual satisfaction is affected by variables that can be associated with each of these constructs. One possible individual difference that can have an effect on relationship satisfaction, sexual satisfaction and problematic pornography consumption is the beliefs about the malleability of sexual life.

According to the Mindset theory (Dweck, 2012; Dweck, Chiu, & Hong, 1995a, 1995b), human actions can be analyzed and interpreted in the framework of entity theory and incremental theory. According to these implicit theories, people construct different assumptions about the changeability of personal attributes. Individuals characterized by the entity theory (fixed mindset) believe that basic personal attributes (such as intelligence or willpower) are fixed and cannot be changed, although new things can be learnt. On the contrary, in the case of the incremental theory (growth mindset), people believe that these basic attributes can be changed, improved with efforts and good strategies. These implicit beliefs have a great effect on the behavior (Burnette, O'Boyle, Van Epps, Pollack, & Finkel, 2013). People's beliefs about the malleability of attributes can play an important part in making more efforts and trying out new strategies in order to develop the given ability (Dweck, 2008; Dweck, 2012; Job, Walton, Bernecker, & Dweck, 2013; Paunesku et al., 2015; Romero, Master, Paunesku, Dweck, & Gross, 2014). Implicit theories are domain-specific and might include attributes such as intelligence, willpower, or even relationships.

The implicit theories of relationships distinguish between beliefs in romantic destiny or *soulmate theory* and beliefs in relationship growth or *work-it-out theory* (Franiuk, Cohen, & Pomerantz, 2002; Knee, 1998; Knee, Patrick, & Lonsbary, 2003). Soulmate theorists believe that relationship partners are meant for each other and they can only have a satisfying relationship if they find this perfectly matching partner. Work-it-out theorists might believe that a satisfying relationship is a result of working on problems and gradually improving the relationship, therefore anyone could be a partner as long as they can work on this relationship. Since previous research (Franiuk et al., 2002; Knee, Nanayakkara, Vietor, Neighbors, & Patrick, 2001) found that soulmate theorists—fixed relationship mindset—are less satisfied with their relationships and they can deal with the negative events more hardly than work-it-out theorists—growth relationship mindset—we expect similar pattern in the case of sex mindset beliefs. People with fixed sex mindset beliefs will be less satisfied with their relationships and sexual life while people characterized with growth sex mindset will be more satisfied with their relationship and sexual life.

Fixed sex mindset beliefs—meaning that one cannot fundamentally change his/her sexual life—implicate less effort to improve sexual life and lower probability of trying new "strategies". The relative lack of these efforts and the lack of experiencing the effect of new "strategies" might lead to less excitement in the sexual life and as a consequence of the fixed sex mindset belief; it might stabilize the low quality of one's sexual life which might be associated with less satisfaction in the relationship. Another negative consequence of the fixed mindset can be related to pornography use. Pornography can provide an effortless sexual excitement and the person with fixed sex mindset beliefs

does not risk the potential failure of trying out new strategies. We expect an inverse pattern of associations in the case of the growth sex mindset beliefs which are negatively related to problematic pornography consumption while these beliefs are positively related to relationship satisfaction and sexual satisfaction.

Growth sex mindset includes beliefs regarding the quality of sexual life depend on the efforts of the individual and inclination of seeking new strategies. This belief can improve the quality of the sexual life and these changes in the sexual life can be a source of novelty which has positive impact on relationship satisfaction. Growth sex mindset beliefs could provide sexual novelty via efforts and new strategies and these beliefs reduce the necessity to use pornography which is ready-made and offers immediate novelty. Moreover, these beliefs are related to heightened relationship satisfaction and sexual satisfaction as a consequence of the effortful and strategy seeking behaviors. Following this logical link, we suppose that the beliefs about the changeability of sexual life are directly related to relationship satisfaction and sexual satisfaction and indirectly related to it through problematic pornography use. It can be hypothesized that fixed sex mindset beliefs play an important role in the maintenance of problematic pornography use, because these beliefs implicate that one's sexual behaviors—such as problematic pornography use—cannot be changed, thus the individual will not make efforts to change the problematic behavior. Thus, this maintained problematic use will contribute to the lower levels of relationship satisfaction and sexual satisfaction by several processes such as less communication or less sexual intercourse between the partners.

By introducing the concept of sex mindset, the goal of the present study was to have a deeper understanding of the weak negative link between problematic pornography use and relationship satisfaction and sexual satisfaction. This goal was double-folded: in the first study, exploratory and confirmatory factor analyses were employed to examine the factor structure of a new Sex Mindset Scale assessing beliefs about one's changeability of his/her sexual life. In the second study, using structural equation modeling, a model was created in which sex mindset appeared as a pervasive implicit theory of sexuality behind problematic pornography use, relationship satisfaction and sexual satisfaction controlling for the effect of gender.

1. Study 1

The aim of the present study was to create a Sex Mindset Scale (for the final version, see Appendix 1) with exploratory factor analysis (EFA) (Sample 1) and confirmatory factor analysis (CFA) (Sample 2). Specifically, the goal of the present research was to create a scale (1) which can measure beliefs about the malleability of sexual life, (2) which is short, (3) and which has strong psychometric properties in terms of reliability and internal consistency.

2. Method

2.1. Participants

2.1.1. Sample 1

Hungarian participants were recruited from social networking sites and diverse online forums in the summer of 2016. Out of the 755 participants, 377 were female (49.9%). They were aged between 18 and 54 ($M_{age} = 22.85$, $SD_{age} = 5.58$). Regarding their place of residence, 279 of them (37.0%) lived in the capital, 115 (15.2%) in county towns, 253 (33.5%) in towns, and 108 (14.3%) in villages. Regarding their level of education, 6 (0.8%) had primary school degree, 115 (15.2%) had ongoing high school studies, 158 (20.9%) had a high school degree, 339 (44.9%) had ongoing higher education studies, and 137 (18.1%) of them had a degree in higher education (bachelor, masters or doctoral). Regarding their relationship status, 329 (43.6%) of them were singles, 405 (53.6%) were in a relationship and 21 (2.8%) were married.

2.1.2. Sample 2

Participants were recruited from social networking sites and diverse online forums in the summer of 2016. 769 Hungarian participants (female = 385, 50.1%), aged between 18 and 64 (M_{age} = 26.49, SD_{age} = 8.37) took part in this research. 174 of them (22.6%) lived in the capital, 172 (22.4%) in county towns, 308 (41.0%) in towns, and 115 (15.0%) in villages. Regarding their level of education, 17 (2.2%) had primary school degree, 50 (6.5%) had ongoing high school studies, 207 (26.9%) had a high school degree, 303 (39.4%) had ongoing higher education studies, and 192 (25.0%) of them had a degree in higher education (bachelor, masters or doctoral). Regarding their relationship status, 313 (40.7%) of them were singles, 397 (51.6%) were in a relationship and 59 (7.7%) were married.

2.2. Measures

2.2.1. Sex Mindset Scale (SMS)

This measure was created to assess people's beliefs of the changeability of their sexual life. The basis was the Implicit Theory Measures of Dweck et al. (1995a) which measured three dimensions: the beliefs about the changeability of intelligence, morality and the world. Three items were adapted from the Intelligence factor and were translated on the basis of the protocol of Beaton, Bombardier, Guillemin, and Ferraz (2000). Additionally, three reverse-coded items were created to minimize agreement acquiescence, the tendency to agree with all items (Paulhus, 1991). Respondents were asked to indicate their level of agreement on a six-point scale (1 = strongly agree; 6 = strongly disagree). Lower scores indicate fixed mindset about sexual life and higher scores indicate growth mindset about sexual life.

2.3. Procedure

The study was conducted with the approval of the Institutional Review Board of the related university and in accordance with the Declaration of Helsinki. The research was conducted using an online questionnaire system, filling out took approximately 5 minutes. Data collection occurred in the summer of 2016. First, participants were informed about the aims and the content of the study. They were assured of their anonymity and the confidentiality of their answers. Also, they were assured that they could stop the participation without any consequences whenever the filling process was uncomfortable or unpleasant for them. They had to check a box if they were inclined to participate. If they did not check the box, then they were not part of the research and could not continue the filling out. The questionnaire consisted of two parts: the first one contained the six items of the Sex Mindsets Scale (SMS); the second part contained different types of demographic questions such as gender, age, level of education, and relationship status.

2.4. Statistical analysis

Descriptive statistical analyses and exploratory factor analyses (e.g. calculating skewness-kurtosis values and performing correlations) were performed with SPSS 22. In exploratory factor analyses, principal axis factoring extraction was used with promax rotation (Kappa = 4), because oblique rotations allow better understanding of the relations between the factors (Brown, 2015). Furthermore, the scree test (Cattell, 1966) and the Kaiser-Guttman criterion (Guttman, 1954; Kaiser, 1960) were used in order to determine the adequate number of factors. Based on Tabachnick and Fidell (2001), the minimum loading of an item was required to be at least 0.32 and cross-loading occurred when an item loaded at least 0.32 on two or more factors. Based on Muthén and Kaplan's (1985) rather strict suggestions, the normality thresholds for skewness and kurtosis should be between −1 and +1. However, according to Curran, West, and Finch's (1996) suggestions, skewness values >2, and kurtoses values >7 can cause problems in the

analyses, thus these more permissive, moderate values may be acceptable.

Confirmatory factor analysis (CFA) was performed using Mplus 7.3 (Muthén & Muthén, 1998–2012) with robust maximum-likelihood estimation (MLR). When assessing the models, multiple goodness of fit indices were observed (Bentler, 1990; Brown, 2015; Browne & Cudeck, 1993; Hu & Bentler, 1999; Schermelleh-Engel, Moosbrugger, & Müller, 2003): the Comparative Fit Index (CFI; good: ≥ 0.95), the Tucker-Lewis Index (TLI; good: ≥ 0.95), the root mean square error of approximation (RMSEA; good: ≤ 0.06) with its 90% confidence interval (90% CI), the test of close fit (CFit; good: ≥ 0.10), the standardized root mean square residual (SRMR; good: ≤ 0.05), the Akaike Information Criterion (AIC; Bozdogan, 1987), and the Bayesian Information Criterion (BIC; Schwarz, 1978). AIC and BCC are useful in model comparison, but they do not have a clear cut-off. The general rule is that the lower this value the better the model fit is.

Regarding reliability, internal consistencies were also measured by the Cronbach alpha value which is considered acceptable above 0.70 and good above 0.80 (Nunnally, 1978). Factor determinacy and composite reliability scores were also calculated. Factor determinacy can range from zero to one with higher scores showing higher levels of reliability (Muthén & Muthén, 1998–2012), while composite reliability scores are considered acceptable above 0.70 (Nunnally & Bernstein, 1994).

3. Results

3.1. Exploratory factor analysis (Sample 1)

The items of the Sex Mindset Scale did not violate the normality in terms of skewness (ranging from −0.66 to 0.53) and kurtosis (ranging from −1.01 to −0.47). The results of the exploratory factor analysis showed a one-factor solution; this solution accounted for 58.42% of the total variance. The KMO was equal to 0.86 (Bartlett's Test of Sphericity: $p < 0.001$), the factor loadings ranged from 0.70 to 0.78. The scale had good reliability in terms of internal consistency (α = 0.89). The analysis indicated that the six-item, one-factor solution was acceptable.

3.2. Confirmatory factor analysis (Sample 2)

In the first step of the structural analysis, all six items were entered as indicators of the latent sex mindset variable. This model did not provide acceptable results regarding all fit indices (CFI = 0.870; TLI = 0.783; RMSEA = 0.156 [90% CI 0.136–0.176]; CFit = 0.000; SRMR = 0.056; AIC = 14,644; BIC = 14,727; χ^2 = 177.36, $p < 0.01$). In order to improve this factor structure with poor model fit indices, modification indices were inspected. As a result, Item 6 was removed as it had several error covariances. The 5-item solution yielded a better fit compared to the previous one (CFI = 0.916; TLI = 0.832; RMSEA = 0.141 [90% CI 0.115–0.169]; CFit = 0.000; SRMR = 0.045; AIC = 12,446; BIC = 12,516; χ^2 = 81.44, $p < 0.01$), but the model was not acceptable. By inspecting modification indices again, Item 3 and 5 had high error covariance as these were the two reverse-coded items. Therefore, an error covariance was inserted between these two variables. In this final model (CFI = 0.996; TLI = 0.991; RMSEA = 0.033 [90% CI 0.000–0.070]; CFit = 0.731; SRMR = 0.013; AIC = 12,333; BIC = 12,407; χ^2 = 7.38, p = 0.117), factor loadings were high, ranging from 0.62 to 0.88 (see Fig. 1). The scale demonstrated adequate levels of reliability in terms of Cronbach alpha value (α = 0.86), factor determinacy (FD = 0.94) and composite reliability (CR = 0.85). Skewness (−0.37; SD = 0.09) and kurtosis (−0.60; SD = 0.18) values were also adequate. The results suggest that the 5-item unidimensional structure with one error-covariance has acceptable factor structure and reliability.

Socio-demographic differences were found regarding the sex mindset scores: significant gender ($t(767)$ = −3.00, $p < 0.01$) and relationship status-related ($t(767)$ = −3.17, $p < 0.01$) differences can be
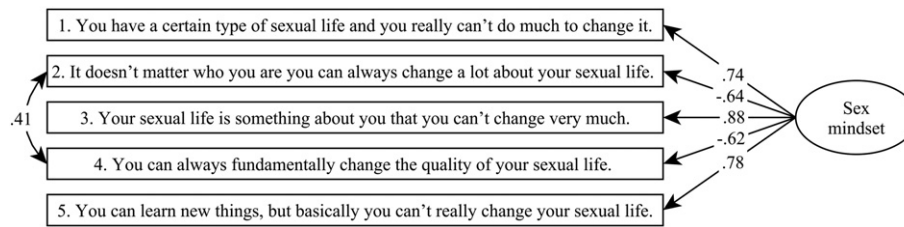
Fig. 1. The final CFA model of the Sex Mindset Scale. *Note.* One-headed arrows represent standardized regression weights; two-headed arrows represent covariances. Factor loadings are standardized and significant at $p < 0.01$.

noted. Females had slightly higher scores ($M = 4.34$, $SD = 1.19$) on the Sex Mindset Scale than males ($M = 4.08$, $SD = 1.23$) and people in relationship ($M = 4.32$, $SD = 1.22$) had also slightly higher scores than single people ($M = 4.04$, $SD = 1.19$).

4. Study 2

Previous studies found that problematic pornography consumption is negatively related to relationship satisfaction, relationship quality, relationship investment and sexual satisfaction (Blais-Lecours et al., 2016; Stewart & Szymanski, 2012; Szymanski & Stewart-Richardson, 2014; Szymanski et al., 2015). Therefore, the first goal of the present study was to measure the link between problematic online pornography use and relationship satisfaction and sexual satisfaction. The second goal of this study was to test the direct and indirect links between sex mindset, problematic pornography use, relationship satisfaction and sexual satisfaction. In this model, we suppose that the link between sex mindset beliefs and relationship satisfaction and sexual satisfaction is partially mediated by problematic pornography use. Moreover, on the basis of previous studies (Bőthe et al., 2017; Haggstrom-Nordin, Hanson, & Tyden, 2005; Svedin, Akerman, & Priebe, 2011; Traeen et al., 2004) men are more likely to develop problematic pornography use, therefore, we aimed to include the effect of gender in the examined model.

General fixed mindset beliefs can provide ground for problematic pornography use as an easy way of getting sexual excitement—instead of making efforts to create a more passionate relationship—that can reduce relationship satisfaction and sexual satisfaction in long run. However, we may suppose that fixed sex mindset can contribute to lower relationship satisfaction and sexual satisfaction. Therefore, we expected that via problematic pornography use, beliefs about the changeability of his/her sexual life can be related to lower relationship satisfaction as well. From the other perspective, growth mindset beliefs about one's sexual life can reduce the necessity of sexual novelty seeking via only pornography and these beliefs can lead to more experienced pleasure and higher satisfaction in the relationship. In sum, growth sex mindset beliefs—through making efforts and trying outing new strategies in the sexual life—can be related to less problematic pornography use and more satisfaction with the relationship and sexual life.

5. Method

5.1. Participants

5.1.1. Sample 3

Hungarian participants were recruited from an online platform that has over 200.000 subscribers in the winter of 2017. Two requirements were established for participating in the present study: (a) being in any kind of relationship and (b) having watched pornography at least once in the last 12 months. Out of the 24,372 participants, 10,463 (female = 3090, 29.5%) met these criteria. They were aged between 18 and 76 ($M_{age} = 34.36$, $SD_{age} = 11.08$). Regarding their place of residence, 5519 of them (52.7%) lived in the capital, 1677 (16.0%) in county towns, 2265 (21.6%) in towns, and 1002 (9.6%) in villages. Regarding

their level of education, 252 (2.4%) had primary school degree, 428 (4.1%) had vocational degree, 3150 (30.1%) had a high school degree, and 6633 (63.4%) had a degree in higher education (bachelor, masters or doctoral).

5.2. Measures

5.2.1. Sex Mindset Scale
See Study 1 for details.

5.2.2. Problematic pornography consumption scale (PPCS)
The 18-item questionnaire (Bőthe et al., 2017) is based on the six components addiction model of Griffiths (2005) and it assesses problematic online pornography use along six dimensions with three items on each dimension: tolerance (i.e. "*I felt that I had to watch more and more porn for satisfaction.*"), mood modification (i.e. "*I released my tension by watching porn.*"), withdrawal (i.e. "*I became stressed when something prevented me from watching porn.*"), relapse (i.e. "*I unsuccessfully tried to reduce the amount of porn I watch.*"), salience (i.e. "*I felt that porn is an important part of my life.*") and conflict (i.e. "*I felt porn caused problems in my sexual life.*"). The overall internal consistency of the scale was acceptable ($\alpha = 0.91$). Participants had to respond using a 7-point scale (1 = "never"; 7 = "all the time") regarding the last 6 months.

5.2.3. Relationship satisfaction
It was assessed using one item ("*In general, how satisfied are you with your relationship?*") of the Relationship Assessment Scale (Hendrick, 1988; Martos, Sallay, Szabó, Lakatos, & Tóth-Vajna, 2014). Participants had to respond using a 5-point scale (1 = "not satisfied"; 5 = "very satisfied"). This item showed strong positive correlation with the summed score of the Relationship Assessment Scale on previous samples (correlations ranged between 0.84 and 0.86),[2] therefore the use of the one-item scale is sufficient.

5.2.4. Satisfaction with sexual life
Sexual satisfaction was assessed using one item ("*In general, how satisfied are you with your sexual life?*"). Participants were asked to respond on a five-point scale (1 = "not satisfied", 5 = "very satisfied"). This measure was modeled on the question used to assess relationship satisfaction. On the basis of prior studies, this single item can appropriately assess satisfaction with sexual life (Mark, Herbenick, Fortenberry, Sanders, & Reece, 2014; Philippe, Vallerand, Bernard-Desrosiers, Guilbault, & Rajotte, 2016).

5.3. Procedure

The study was conducted with the approval of the Institutional Review Board of the related university and in accordance with the Declaration of Helsinki. The research was conducted using an online questionnaire system, filling out took approximately 15 minutes. Data collection occurred in the winter of 2017. Participants were informed

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[2] For further information, contact the corresponding author.

about the aims and the content of the study. They were assured of their anonymity and the confidentiality of their answers. They were assured that they could stop the participation without any consequences whenever the filling process was uncomfortable or unpleasant for them. First, they answered demographic questions (e.g., gender, age, relationship status) then they filled the Sex Mindsets Scale (SMS); the Problematic Pornography Consumption Scale, and they indicated their relationship and sexual satisfaction.

5.4. Statistical analysis

Structural equation modeling (SEM) was used to explore the associations of sex mindset, problematic pornography use (PPCS), relationship satisfaction and sexual satisfaction. The same model fit indices with their respective cut-off values were used that can be seen in Study 1. However, in the present analysis the mean- and variance-adjusted weighted least squares estimator (WLSMV) was used as the PPCS items had severe floor effects (Finney & DiStefano, 2006).

6. Results

Descriptive data and correlations between the variables can be seen in Table 1. By using structural equation modeling we investigated the direct and indirect links between gender, sex mindset beliefs, problematic pornography use, relationship satisfaction and sexual satisfaction. The model with standardized estimates is presented on Fig. 2.

In the model, the fit indices were acceptable (CFI = 0.976, TLI = 0.973, RMSEA = 0.050 [90% CI 0.049–0.051]). According to this model (see Fig. 2), gender had a positive, but weak effect on sex mindset beliefs ($\beta = -0.17$, $p < 0.01$) and a negative, medium effect on problematic pornography use ($\beta = -0.39$, $p < 0.01$). Sex mindset beliefs had a direct negative, but weak effect on problematic pornography use ($\beta = -0.17$, $p < 0.01$), and a direct positive, medium effect on both relationship satisfaction ($\beta = 0.32$, $p < 0.01$) and sexual satisfaction ($\beta = 0.42$, $p < 0.01$). Moreover, problematic pornography use had only weak, negative effects on relationship satisfaction ($\beta = -0.08$, $p < 0.01$) and sexual satisfaction ($\beta = -0.10$, $p < 0.01$). The explained variance of relationship satisfaction was 12%, while the explained variance of sexual satisfaction was 21%. In sum, the direct link between sex mindset beliefs and relationship satisfaction and sexual satisfaction were stronger than the indirect link via problematic pornography use.

Note. Gender was coded as 0 = male, 1 = female. All variables presented in ellipses are latent variables. For the sake of clarity, indicator variables related to them were not depicted in this figure. One-headed arrows represent standardized regression weights, two-headed arrows represent standardized covariances. All pathways were significant at level $p < 0.01$.

7. General discussion

The goal of the present research was to assess people's beliefs about the malleability of their sexual behaviors. For this reason, the five-item Sex Mindset Scale (SMS) was developed and proved to be an adequate tool in assessing malleability beliefs related to sexual life. According to our results, socio-demographic variables could have an effect on sex mindset as women and individuals in a relationship were more likely to have growth sex mindset. Moreover, the associations between gender, sex mindset, problematic pornography use, relationship satisfaction and sexual satisfaction were examined. According to our results, beliefs about the changeability of sexual life can play an important role in relationship satisfaction, sexual satisfaction and in problematic pornography use as well.

Growth sex mindset beliefs had a weak negative effect on problematic pornography use, and growth sex mindset beliefs had a stronger positive effect on relationship satisfaction and sexual satisfaction. Moreover, sex mindset beliefs had an indirect, weak association with relationship satisfaction and sexual satisfaction via problematic pornography use. These results suggest that beliefs about the malleability of sexual life play a stronger role in sexual satisfaction and relationship satisfaction than problematic pornography use. Therefore, growth sex mindset beliefs can play a protective role regarding the negative effects of problematic pornography use. Our results are in line with previous ones concerning the incremental beliefs of relationships. Similarly to soulmate theories, fixed mindset beliefs were negatively linked to relationship satisfaction and sexual satisfaction (Franiuk et al., 2002; Knee et al., 2001).

There are many potential psychological mechanisms behind these associations. First, fixed sex mindset could lead to lower relationship satisfaction and sexual satisfaction. Three potential reasons of this link can be proposed: (1) fixed sex mindset beliefs can prevent one from making efforts to improve his/her sexual life; (2) these beliefs can also prevent this individual from seeking new "strategies" that might contribute to the more pleasurable sexual life; (3) these beliefs can prevent him/her from asking advice how to improve his/her relationship. All of these reasons can make difficulties in the change of sexual life. Individuals who believe that they can change their sexual life experience higher levels of satisfaction because they experience that they have control over their sexual life and they can influence it in a positive way. Based on these beliefs, they might gather previous experiences when they were able to improve their sexual life in the past and this provides them more optimistic prospects. However, as far as the authors know, research on the sexuality-related beliefs is very rarely examined. Further research is needed to understand the far reaching effects of sexuality-related mindset beliefs.

If one does not find novelty and pleasure in his/her sexual life, pornography use can provide an effortless, ready-made solution to gain sexual excitement. This can explain the association between sex

Table 1
Descriptive statistics of the included questionnaires and correlations between the examined variables (N_3 = 10.463).

Scales	Range	Mean (SD)	Skewness (SD)	Kurtosis (SD)	α	1	2	3	4	5
1. Sex mindset scale	1–6	4.43 (1.00)	−0.59 (0.02)	0.01 (0.05)	0.86	–				
2. Relationship satisfaction	1–5	4.09 (0.94)	−1.05 (0.02)	0.93 (0.05)	–	0.28[*]	–			
3. Sexual satisfaction	1–5	3.76 (1.16)	−0.82 (0.02)	−0.12 (0.05)	–	0.38[*]	0.57[*]	–		
4. Problematic pornography consumption scale	1–7	1.86 (0.95)	1.65 (0.02)	2.80 (0.05)	0.94	−0.18[*]	−0.13[*]	−18[*]	–	
5. Frequency of pornography watching	1–10[a]	6.53 (2.45)	−0.44 (0.02)	−0.76 (0.05)	–	−0.09[*]	−0.12[*]	−0.15[*]	0.51[*]	–
6. Time spent with pornography watching per occasion	1–180[b]	25.72 (19.91)	2.77 (0.02)	12.32 (0.05)	–	−0.04[*]	−0.03[*]	−0.05[*]	0.29[*]	0.18[*]

Note. α = Cronbach alpha.
[*] $p < 0.01$.
[a] On a scale of 1 = never, 2 = once in the last year, 3 = 1–6 times in the last year, 4 = 7–11 times in the last year, 5 = monthly, 6 = two or three times a month, 7 = weekly, 8 = two or three times a week, 9 = four or five times a week, 1 = six or seven times a week.
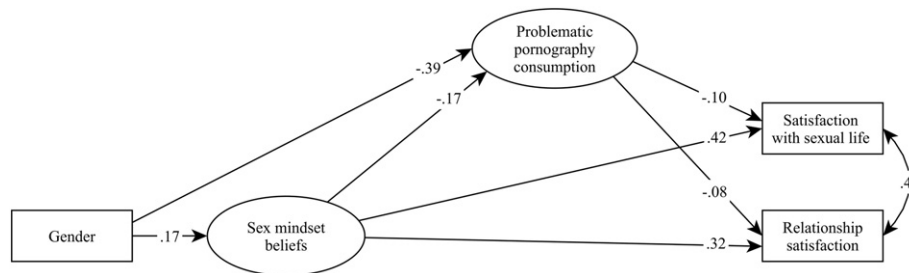[b] Participants indicated their responses in minutes.

Fig. 2. The mediation model of gender, sex mindset, problematic pornography use, relationship satisfaction and sexual satisfaction ($N_3 = 10,463$).

mindset and problematic pornography use. Problematic pornography consumption had several negative effects on the users' lives such as dissatisfaction with romantic relationship or dissatisfaction with sexual life (Gwinn et al., 2013; Oddone-Paolucci et al., 2000; Szymanski & Stewart-Richardson, 2014); however, our cross-sectional preliminary findings suggest that beliefs about the malleability of sexual life plays a more important part in the levels of relationship satisfaction and sexual satisfaction. Thus, instead of fighting this enormous pornography industry, it might be better to put an emphasis on such interventions that might reduce the negative effect of pornography through belief change. Changing beliefs through interventions has been established as an effective method in the domains of intelligence and willpower (Job et al., 2013; Paunesku et al., 2015), thus, it is possible that sex mindset interventions could be an efficient yet unexplored area.

This study is not without limitations. We supposed that sex mindset was related to problematic pornography use, relationship satisfaction and sexual satisfaction, but we could not know the direction of these associations, as these can be unidirectional or bidirectional (Byers, 2005; Lambert et al., 2012). Further variables (e.g., hypersexuality) can have a potential effect on the associations between sex mindset beliefs, problematic pornography use, relationship satisfaction and sexual satisfaction. As self-reported, cross-sectional methods were applied, possible biases (e.g. recall bias, social desirability bias) have to be considered. Sexuality-related mindset beliefs may be temporally stable or they may change over time. The results referring to single respondents have more fixed mindset than those who are in relationship may refer to situational effects influencing these beliefs. Also, causality cannot be inferred and the generalization of the present results could be challenged as the used samples were relatively large but not representative. Finally, it is important to mention that the magnitude of explained variances are relatively small, which can be assigned to the low mean of problematic pornography use in the present sample.

8. Conclusion

Our findings contribute to a greater body of literature indicating that pornography use does not always have strong negative or any negative consequences in people's romantic lives (e.g., Hald & Malamuth, 2008;

Hald, Smolenski, & Rosser, 2013; Poulsen, Busby, & Galovan, 2013). Therefore, it might be possible that instead of overemphasizing the harmful consequences of pornography use it might be more useful to claim attention to growth sex mindset beliefs. This way, instead of changing the social situation (the presence of pornography), a relevant interface (the social construct of sex mindset beliefs) between the situation and the individual could be altered in a positive way which is related to relationship and sexual satisfaction.

9. Compliance with ethical standards

9.1. Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/ or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

9.2. Informed consent

Informed consent was obtained from all individual participants included in the study.

Conflict of interest

The authors declare no conflict of interest.

Funding sources

Conflict of interest

The authors declare no conflict of interest.

Appendix 1
Sex Mindset Scale
English version:
Please indicate how much you agree or disagree with each statement on the following 6-point scale.

1 – Strongly agree	2 – Agree	3 – Mostly agree	4 – Mostly disagree	5 – Disagree		6 – Strongly disagree			
				1	2	3	4	5	6
1. You have a certain type of sexual life and you really can't do much to change it.				O	O	O	O	O	O
2. It doesn't matter who you are you can always change a lot about your sexual life. (reverse-coded)				O	O	O	O	O	O
3. Your sexual life is something about you that you can't change very much.				O	O	O	O	O	O
4. You can always fundamentally change the quality of your sexual life. (reverse-coded)				O	O	O	O	O	O
5. You can learn new things, but basically you can't really change your sexual life.				O	O	O	O	O	O

Scoring: Add the scores of the items.

Vélekedések a Szexuális Életről Skála

Hungarian version:

Kérjük, jelöld be a következő hatfokozatú skálán, hogy menyire értesz egyet az alábbi állításokkal!

1 – teljesen egyetértek	2 – egyetértek	3 – inkább egyetértek	4 –inkább nem értek egyet	5 – nem értek egyet	6 –egyáltalán nem értek egyet			

	1	2	3	4	5	6
1. Valamilyen szexuális élettel rendelkezel, és nem igazán tudsz sokat tenni azért, hogy ezt megváltoztasd.	O	O	O	O	O	O
2. Nem számít, hogy ki vagy, a szexuális életeden sokat tudsz változtatni. (fordított)	O	O	O	O	O	O
3. A szexuális életed egy olyan veled kapcsolatos dolog, amin nem sokat tudsz változtatni.	O	O	O	O	O	O
4. Alapvetően mindig képes vagy változtatni azon, hogy milyen a szexuális életed. (fordított)	O	O	O	O	O	O
5. Megtanulhatsz néhány új dolgot, de a szexuális életeden alapvetően nem tudsz változtatni.	O	O	O	O	O	O

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